

In the Claims

1. (Currently Amended) An apparatus for driving a liquid crystal display, the apparatus comprising:
 - a signal controller for generating image data and digital gamma signals for different pixel colors;
 - a gray voltage generator receiving the digital gamma signals that are useful for generating independent gamma curves for the different pixel colors from the signal controller and converting the digital gamma signals into analog gamma reference voltages coupled to the signal controller, wherein the gray voltage generator generates gray voltage signals that are specific to the different pixel colors, the gray voltage generator including:
 - a first color-specific gamma voltage register; and
 - a second color-specific gamma voltage register coupled to the first gamma voltage register wherein the first and second color-specific gamma voltage registers store digital gamma voltages received from the signal controller for a specific pixel color; and
 - a data driver coupled to the gray voltage generator and the signal controller, wherein the data driver converts each one of the image data digital signals to a corresponding data voltage analog signal by selecting one of the gray voltages based on the analog gamma reference voltages that is associated with the same pixel color as the image data voltage signals that is associated with the same pixel color as the digital signal that is being converted.
2. (Original) The apparatus of claim 1, wherein the gray voltage generator separately stores gray voltages for each of the pixel colors and for each voltage polarity.
3. (Canceled)
4. (Currently Amended) The apparatus of claim 1 [[3]], wherein the gray voltage generator further comprises a digital-to-analog converter for converting the digital gamma voltages that are stored in the first and the second color-specific gamma voltage registers into analog gray voltages.

5. (Currently Amended) The apparatus of claim 4, An apparatus for driving a liquid crystal display, the apparatus comprising:

a signal controller for generating image data and digital gamma signals for different pixel colors;

a gray voltage generator receiving the digital gamma signals that are useful for generating independent gamma curves for the different pixel colors from the signal controller and converting the digital gamma signals into analog gamma reference voltages that are specific to the different pixel colors, the gray voltage generator including:

a first color-specific gamma voltage register; and

a second color-specific gamma voltage register coupled to the first gamma voltage register wherein the first and second color-specific gamma voltage registers store digital gamma voltages received from the signal controller for a specific pixel color;

wherein the first color-specific gamma voltage register and the second color-specific gamma voltage register are connected by a first set of ten-bit buses, and at least one of the first and second color-specific gamma voltage registers is connected to the digital-to-analog converter by a second set of ten-bit buses; and

a digital-to-analog converter for converting the digital gamma voltages that are stored in the first and the second color-specific gamma voltage registers into analog gray voltages; and

a data driver coupled to the gray voltage generator and the signal controller, wherein the data driver converts each one of the image data to a corresponding data voltage by selecting one of the gray voltages based on the analog gamma reference voltages that is associated with the same pixel color as the image data.

6. (Original) The apparatus of claim 4, wherein the data driver comprises a plurality of data driving circuits for receiving image data and data control signals from the signal controller, wherein each of the data driving circuits includes a sampling unit for sampling gamma voltage data from the digital-to-analog converter.

7. (Original) The apparatus of claim 6, wherein the sampling unit comprises a plurality of sampling circuits, each of which includes:

a switch that turns on in response to a sampling signal from the signal controller;
a capacitor coupled to the switch for storing the sampled gamma voltage data; and
an analog buffer coupled to the capacitor for outputting the stored gamma voltage data.

8. (Original) The apparatus of claim 6, wherein the image data are transmitted from the signal controller to the data driving circuits by two signal lines that are separately connected between the data driving circuits and the signal controller.

9. (Original) The apparatus of claim 1, wherein the gray voltage generator is coupled to the data driver by a plurality of buses.

10. (Canceled)

11. (Original) The apparatus of claim 1 further comprising a gate driver coupled to the signal controller, wherein the gate driver generates gate control signals in response to signals from the signal controller.

12. (Currently Amended) A liquid crystal panel assembly comprising:
a plurality of pixel electrodes, wherein each of the pixel electrodes is associated with a pixel color;
a common electrode positioned substantially parallel to the pixel electrodes;
a liquid crystal layer positioned between the pixel electrodes and the common electrode;
a data driver for supplying data signals to the pixel electrodes;
a signal controller coupled to the data driver, wherein the signal controller has a register for storing a predetermined number of digital gamma data that are useful for generating independent gamma curves for different pixel colors; and
a gray voltage generator coupled to the pixel electrodes, wherein the gray voltage generator generates gray voltages that are each associated with a pixel color, so that the data driver determines a particular data signal for a particular pixel electrode by using one of the gray voltages that is associated with the pixel color of the particular pixel electrode, the gray voltage generator including:

a first color-specific gamma voltage register; and
a second color-specific gamma voltage register coupled to the first gamma voltage register wherein the first and second color-specific gamma voltage registers store digital gamma voltages received from the signal controller, for a specific pixel color.

13. (Original) The panel assembly of claim 12, wherein the gray voltage generator separately stores gray voltages for each pixel color and voltage polarity.

14. (Canceled)

15. (Currently Amended) The panel assembly of claim 12 ~~[[14]]~~, wherein the gray voltage generator further comprises a digital-to-analog converter for converting the digital data stored in the first and the second gamma voltage registers into analog gray voltages.

16. (Currently Amended) ~~The panel assembly of claim 15;~~ A liquid crystal panel assembly comprising:

a plurality of pixel electrodes, wherein each of the pixel electrodes is associated with a pixel color;

a common electrode positioned substantially parallel to the pixel electrodes;

a liquid crystal layer positioned between the pixel electrodes and the common electrode;

a data driver for supplying data signals to the pixel electrodes; and

a gray voltage generator receiving the digital gamma signals that are useful for generating independent gamma curves for the different pixel colors from the signal controller and converting the digital gamma signals into analog gamma reference voltages that are specific to the different pixel colors, the gray voltage generator including:

a first color-specific gamma voltage register; and

a second color-specific gamma voltage register coupled to the first gamma voltage register wherein the first and second color-specific gamma voltage registers store digital gamma voltages received from the signal controller, for a specific pixel color,
wherein the first gamma voltage register and the second gamma voltage register are connected by a first set of ten-bit buses, and at least one of the first and second gamma

voltage registers is connected to the digital-to-analog converter by a second set of ten-bit buses; and

a digital-to-analog converter for converting the digital data stored in the first and the second gamma voltage registers into analog gray voltages.

17. (Original) The panel assembly of claim 15 further comprising a signal controller coupled to the data driver, wherein the data driver comprises a plurality of data driving circuits for receiving image data and data control signals from the signal controller, wherein each of the data driving circuits includes a sampling unit for sampling gamma voltage data from the digital-to-analog converter.

18. (Original) The panel assembly of claim 17, wherein the sampling unit comprises a plurality of sampling circuits, each of the sampling circuits including:

a switch for controlling the sampling of the gamma voltage data;

a capacitor coupled to the switch for storing the sampled gamma voltage data; and

an analog buffer coupled to the capacitor for outputting the stored gamma voltage data.

19. (Original) The panel assembly of claim 17, wherein the image data are transmitted from the signal controller to the data driving circuits by two signal lines that are separately connected between the data driving circuits and the signal controller.

20. (Canceled)

21. (Original) The panel assembly of claim 12, wherein the gray voltage generator is coupled to the data driver by a plurality of buses.

22-24. (Canceled)